



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,850	09/05/2003	John Yasaitis	2550/184	8594

2101 7590 07/05/2006
BROMBERG & SUNSTEIN LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER

LEE, PATRICK J

ART UNIT PAPER NUMBER

2878

DATE MAILED: 07/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/656,850		YASAITIS, JOHN	
	Examiner		Art Unit	
	Patrick J. Lee		2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9,12-19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9,12-19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to amendment filed June 15, 2006.

Drawings

2. The drawings were received on 6/15/2006. These drawings are not acceptable for the following reasons.
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of the doping of the portion of the photodiode after the receiving electrode is coupled with the photodiode as stated in claim 21 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 1, 8, & 16 are objected to because of the following informalities:

Claim 1 is marked by improper grammar. It would be appropriate to dispose "wherein" after the first instance of "photodiode" in line 4 of claim 1. An "and" should be disposed after the first instance of "photodiode" in line 6 of claim 1. The addition of "wherein" would also lead to "being" changing to "is" in line 4 of claim 1, "permitting" to change to "permits" in line 5 of claim 1, and "converting" changing to "converts" in line 6 of claim 1.

Similar changes are required for claims 8 and 16.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 16, & 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,426,069 to Selvakumar et al.

With respect to claim 1, Selvakumar et al disclose a photodiode device comprising: Ge implant area (8) or SiGe region (see figure 14) as a germanium-based

photodiode (see column 6, lines 56-57); and polysilicon layer (9) or polysilicon gate (see figure 14) as a polysilicon-based receiving electrode coupled with the photodiode while permitting the light to pass through to the photodiode region.

With respect to claim 2, Selvakumar et al disclose the polysilicon gate being doped (see column 3, lines 49-55).

With respect to claim 16, Selvakumar et al disclose a photodiode device comprising: Ge implant area (8) or SiGe region (see figure 14) as a germanium-based photodiode (see column 6, lines 56-57); and polysilicon layer (9) or polysilicon gate (see figure 14) as a polysilicon-based means for receiving light to be converted by the photodiode while permitting the light to pass through to the photodiode region. The polysilicon gate is used for transferring the signal from the photodiode to shift register (see figures 15-17).

With respect to claim 18, Selvakumar et al disclose the polysilicon gate being doped (see column 3, lines 49-55).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 5-9, 12-15, 17, 19, & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,426,069 to Selvakumar et al.

Selvakumar et al disclose the device as described in the discussion of claims 1-2, 16, & 18.

With respect to claim 3, the use of an n-type dopant is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for the desired range of radiation to pass through, while absorbing other radiation (see column 6, lines 53-56).

With respect to claim 5, the use of a bottom electrode coupled to the photodiode is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for additional control and monitoring over the operating parameters of the photodiode.

With respect to claim 6, the use of a waveguide is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for the device taught by Selvakumar et al to be disposed away from the source of radiation sensed.

With respect to claim 7, Selvakumar et al discloses the use of SiO₂ layer as an intrinsic region between the photodiode region and the polysilicon layer, but does not explicitly disclose the doping of the photodiode as claimed. However, such would have been obvious to one of ordinary skill in the art to allow the device flexibility and accuracy in sensing certain wavelength ranges of radiation.

With respect to claims 8-9, Selvakumar et al disclose a photodiode device comprising: Ge implant area (8) or SiGe region (see figure 14) as a germanium-based photodiode (see column 6, lines 56-57); and polysilicon layer (9) or polysilicon gate (see

figure 14) as a polysilicon-based receiving electrode coupled with the photodiode while permitting the light to pass through to the photodiode region. Selvakumar et al discloses the use of SiO₂ layer as an intrinsic region between the photodiode region and the polysilicon layer, but does not explicitly disclose the doping of the photodiode as claimed. However, such would have been obvious to one of ordinary skill in the art to allow the device flexibility and accuracy in sensing certain wavelength ranges of radiation.

With respect to claim 12, the use of a bottom electrode coupled to the photodiode is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for additional control and monitoring over the operating parameters of the photodiode.

With respect to claim 13, the thickness of the electrode is not disclosed, but such would have been obvious to one of ordinary skill in the art in order to give the electrode the transparency required to allow the light to pass through to the photodiode.

With respect to claim 14, the concentration of polysilicon is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow the electrode to remain transparent while capable of its conduction of electric signals.

With respect to claim 15, the use of polysilicon germanium is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for compatibility between the electrode and the photodiode.

With respect to claim 17, the concentration of polysilicon is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow the electrode to remain transparent while capable of its conduction of electric signals.

With respect to claim 19, the use of a bottom electrode coupled to the photodiode is not explicitly disclosed, but such would have been obvious to one of ordinary skill in the art because such would allow for additional control and monitoring over the operating parameters of the photodiode.

With respect to claim 21, the doping process after the receiving electrode is coupled with the photodiode, but such would have been obvious to one of ordinary skill in the art in order to allow for accuracy in detection of the radiation.

Response to Arguments

9. Applicant's arguments with respect to claims 1-3, 5-9, 12-19, & 21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J. Lee whose telephone number is (571) 272-2440. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patrick J. Lee
Examiner
Art Unit 2878

PJL
June 27, 2006



Stephone B. Allen
Primary Examiner